Sample Name:
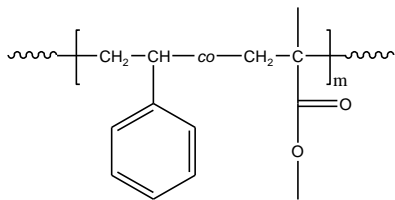**Random Copolymer Poly(styrene-co-methyl methacrylate)**
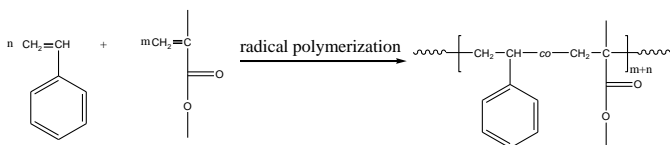
Sample #: P7039-SMMAran

Structure:

Composition:
PS (mol%) : 1.4

Mn x 10^3 PS-co-PMMA	PDI
9.2	1.4
T_g for random polymer	96°C

Synthesis Procedure:
Random Copolymer Poly(styrene-co-methyl methacrylate) is prepared by radical polymerization of styrene and methyl methacrylate in the presence of TEMPO . The scheme of the reaction is illustrated below:
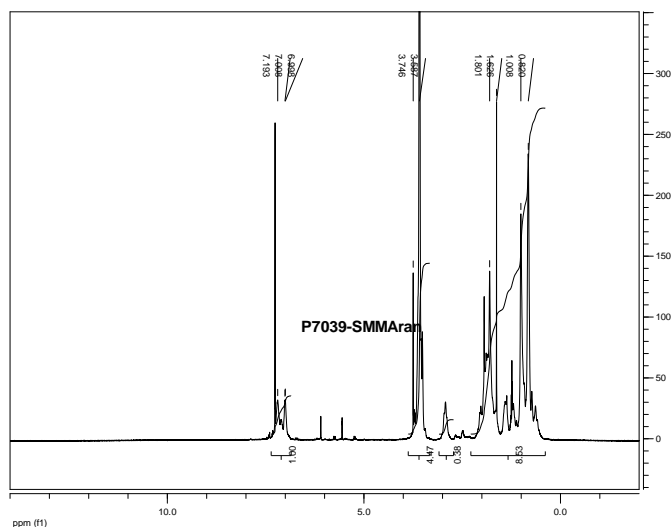

Characterization:
The polymer was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area the aromatic protons of styrene at about 7.05 ppm with the methyl ester protons of methyl methacrylate at about 3.6 ppm.
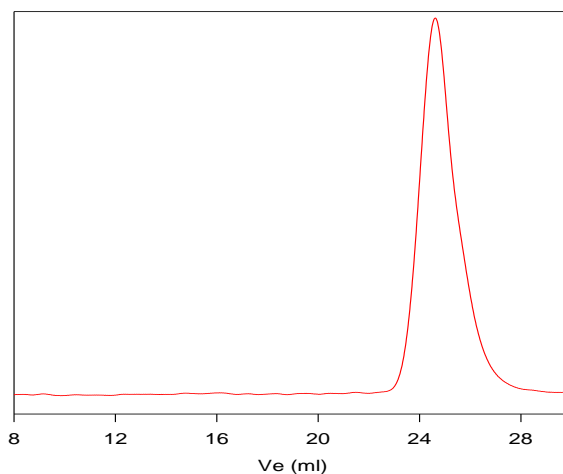
Thermal analysis:
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min.The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:
Random Copolymer Poly(styrene-co-methyl methacrylate) is soluble in CHCl$_3$, THF, DMF, toluene and precipitated out from methanol.

^{1}H-NMR Spectrum of the random copolymer:

SEC of the random copolymer:

P7039-SMMAran

Size exclusion chromatograph of random copolymer: poly(S-co-MMA):
M_n=9200, M_w=12900, M_w/M_n=1.4
Polystyrene content: 11%mol by NMR

Thermogram for the sample: